EXHIBIT 2

Critique of
"REVIEW OF THE RESPONSE BY THE OKLAHOMA DEPARTMENT OF HUMAN SERVICES TO THE SUSPECTED ABUSE AND NEGLECT OF CHILDREN IN ITS CARE"
Dated March 15, 2011,
authored by John Goad, A.M.,
Expert for the Plaintiffs
Case 4:08-cv-00074-GKF-FHM

Submitted by
Andrew Barclay
June 9, 2011

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Introduction

I have been retained by counsel for the OK DHS Defendants to consult and to review Plaintiffs' expert witness reports and depositions and to offer fact and expert testimony on behalf of the OK DHS Defendants. In completing this engagement I have reviewed the expert report of Mr. John Goad, as well as his depositions and considered materials. I have reviewed other materials referenced in my report or provided in my considered materials. I will opine separately on the expert report of Dr. Jerry Milner in a report to be issued on June 15, 2011.

I am a biostatistician and an engineer. I have worked in the field of child welfare for 13 years. I maintain child welfare outcomes statistics for the 12 states that participate in the Fostering Court Improvement project (FCI). I am a funder, a co-founder, and the statistician for the project. The FCI statistics are used to train juvenile court judges, attorneys, and other stakeholders in the interpretation and tracking of their local outcomes. I train, analyze data, and write software in the child welfare field full-time. I also founded and chair the Barton Child Law and Policy Center at the Emory University School of Law. I previously worked part-time building statistical modeling software for major drug manufacturers' new drugs. Prior to that, I worked for 15 years in medical imaging research (PET, SPECT, and MRI).

My educational and professional background, including my publications, is set forth in Appendix A to this report.

Summary

Mr. Goad has performed an assessment of Oklahoma Department of Human Services (OK DHS) decision-making relative to his own and 2 colleagues' judgments regarding maltreatment in custody based on file reviews. Independent reviewers, rigorous sampling, rudimentary statistics, and strong analysis might have painted a compelling picture for us all. Unfortunately, sampling and analysis flaws irreparably damaged Mr. Goad's study. Mr. Goad's many statistical assertions, 1,422 percentages, and over 6,000 numbers paint a confused, disjointed, uninterpretable picture from a sample that is not representative of his universe. The $107,000 spent on this review contributed no substantive information on a central issue of the complaint, an issue that concerns me greatly: the degree to which children are at risk of harm in OK DHS foster care.

Sampling

Universe

On May 11, 2010 Children's Rights emailed Mr. Goad two Excel workbook files.[1] At deposition, Mr. Goad identified these files as the "universe of OCA kids" and the "universe for CPS kids" respectively.[2] The first, "Goad 01592.xls", contained 344 records of children reported maltreated in 219 cases by OK Office of Client Advocacy (OCA) during calendar year 2009. The second, "Goad 01593.xls", contained 1,305 records of children reported maltreated in OK DHS custody (not necessarily foster care) during calendar year 2009.

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[1] Mr. Goad's considered materials Goad 01592.xls and Goad 01593.xls.
[2] Mr. Goad's deposition transcript "67234 GOAD JOHN 041911-CT" p 252 line 22, p 256 line 8.

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Among those children, 666 were involved in 420 investigated referrals, 22 were involved in 18 assessment referrals, and 617 were involved in 464 screened-out referrals. So, following the format of Goad Table III-1, we should have:

Universe/Sample Size

Category	OK DHS supplied files (01592 & 01593)	Unduplicated Universe (N)	Sample
CPS Investigations *referrals*	420	343	84
OKDHS wards	666 (594 unique)	645 (est.)	158
OCA Investigations *referrals*	219	219	41
OKDHS wards	344 (291 unique)	374 (est.)	70
Screen outs *referrals*	464	464	93
OKDHS wards	617 (520 unique)	807 (est.)	162

Table III-1

I have added a column using counts from Goad 01592.xls and Goad 01593.xls. The first, third, and fourth columns are transcribed from Goad p 12 Table III-1. Goad p 15 states "OKDHS identified 343 unduplicated CPS investigations that it conducted during 2009 ..."

77 Missing Referrals

It appears from Goad 01593.xls that OK DHS in fact identified for Mr. Goad 420 unduplicated CPS investigations that it conducted during 2009. Mr. Goad failed to mention deleting any cases from the universe in either his report or his deposition. Mr. Goad did not disclose in his report or his considered materials which records he included in his universe of 343 investigated referrals, so we are left wondering why there is a discrepancy of 77 investigated referrals missing from the 420 investigated referrals supplied to Mr. Goad by OK DHS via Children's Rights.

When analyzing data, it is important to identify any observations deleted from the universe and to provide the reader with the rules that necessitated the deletions and evidence of any bias that the deletions may have injected (e.g. contingency tables and chi-squared or other statistical tests for similarity to the universe). For example, a common reason for screening out cases might be missing data fields. Some statistical procedures require complete data. There are methods (e.g. influence statistics) for testing datasets for "outlier" observations that are deleted to improve accuracy. In the fields of data analysis and data warehousing, data are commonly "cleansed" before analysis. I frequently encounter naïve data cleansing of missing data and outliers by a non-statistician that injects enough bias to make the data nearly useless for inference. Data fields in administrative datasets such as these are often missing, but not often "missing at random" (a statistical term of art), so any assumption that fields are missing at random that leads to an assumption that the deletions injected no bias away from the universe must be supported and tested.

When asked in his deposition "What was the sampling frame you used to create the statistics in the report?" Mr. Goad responded "I don't know what you mean by sampling frame."[3] The term "sampling frame" is a very basic statistical term. Without that basic knowledge of statistics, it is very difficult to reliably inquire into matters as complex as missing observations. A sampling frame that is missing observations from the universe without justification and without testing for bias cannot claim to be representative of the universe.[4]

Estimating Counts of Wards

Mr. Goad was provided with lists of wards by OK DHS via Children's Rights, so he should have been able to count the number of wards in his universe of referrals. Inexplicably, Mr. Goad estimated the number of wards in his universe of referrals. These estimates are shown in Table III-1 above. For example, Goad p 15 states "...I assumed that the number of alleged child victims per CPS investigation in the universe of CPS investigations is the same as the number in the sample (1.88)." It is left to the reader to deduce that Mr. Goad divided his count of 158 (non-unique, 154 unique) wards in his investigation sample by his count of 84 investigations in his investigative sample, so 158/84=1.88 wards per investigation. Mr. Goad multiplied 1.88 by his 343 count of investigated referrals in his universe to arrive at his estimate of 645 wards in his universe of investigated referrals. Goad p 15 states "Based on that assumption, I concluded that during 2009, 645 children in the care of OKDHS were alleged to be victims in CPS investigations." Children's Rights provided Mr. Goad with a full listing of the 666 children (594 unique children) in the care of OK DHS who were alleged to be victims in CPS investigations during calendar year 2009.

Knowing that there were 666 wards in the universe of 420 investigated referrals in the original file, one might make a better estimate from the full universe that there were 666/420=1.59 wards per investigation. That estimate would yield 1.59*343=545. That is, 100 fewer wards than Mr. Goad estimated in his universe of investigated referrals. In the original file given to Mr. Goad there were also 30 fewer OCA and 190 fewer screened out wards than Mr. Goad estimated. In his deposition Mr. Goad states "I mean, I would be surprised if you were to actually count every child, if it came out to exactly the same number, but it would be very close."[5] The motivation for these estimates when true counts were available is baffling.

23 Wards in Sample not in Universe

Mr. Goad included in his considered materials an SPSS (originally, Statistical Package for the Social Sciences) data file, "Goad 01588.sav" (native file name "invest-victims.sav"). This file contains records for each of the 158 wards in Mr. Goad's CPS investigation sample. Twenty-three of those 158 records lack corresponding records in "Goad 01593.xls", the universe of CPS investigations sent to Mr. Goad. Since I can find no explanation for this discrepancy in Mr. Goad's report, considered materials, or deposition, I find that 23 of 158 wards in Mr. Goad's CPS investigation sample came from outside the universe of wards

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[3] Mr. Goad's deposition transcript "67235 GOAD JOHN 042011-CT" p 28 line 15.

[4] Lohr, SL. (1999) Sampling: Design and Analysis. Duxbury Press:Pacific Grove, CA. Chapters 1 & 8.

[5] Mr. Goad's deposition transcript "67235 GOAD JOHN 042011-CT" p 18 line 20.

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provided by OK DHS. A review that includes observations outside of the universe cannot claim to be representative of the universe.

Custody vs. Foster Care

OK DHS supplied lists of children in OK DHS custody, as requested. It is important to know that not all children in OK DHS <u>custody</u> are in OK DHS <u>foster care</u>. This can be an important distinction. A child in OK DHS foster care is necessarily in OK DHS custody, but the inverse is not necessarily true. There are children in OK DHS custody who are not in OK DHS foster care. Mr. Goad's retainer specifies "... reports of the alleged abuse and neglect of foster children in DHS custody." This reflects a lack of understanding of the difference between custody and foster care. Among the children in Mr. Goad's universe and sample we do not know how many were in foster care at the time of the referral, so Mr. Goad's findings may not be representative of children in OK DHS foster care.

Unit of Observation

Nowhere in Mr. Goad's materials is the unit of observation or the sampling unit stated, but the reader can infer from the report that Mr. Goad chose <u>referral</u> as his unit of observation. This is a wise choice. It is clear from Mr. Goad's deposition that he does not fully appreciate the wisdom of this choice: "Q. Do I understand correctly you didn't do sampling, sample selection, based on children; you did it on cases? A. There's no distinction. We selected cases, but necessarily the children in those cases are also a statistically valid sample. The same math applies."[6]

A single referral often involves multiple children (up to 6 in this universe). The counts of referrals in Table III-1 are unduplicated, but the counts of wards in Table III-1 are duplicated. The observed data for children in a referral will be highly correlated. The observed data for the same child in different referrals will also be correlated. Statistical inference often assumes independent (uncorrelated) samples. A simple random sample from a highly correlated population will have what statisticians refer to as an "effective sample size" that is less than the number of samples. Units of referrals will usually be more independent (less correlated) than units of children, so referral is the better unit of observation for sampling and statistical inference. A conservative assumption would be that all children in a referral are perfectly correlated. In that case, all of Mr. Goad's statistics with respect to wards are invalid.

Randomization

Mr. Goad asserts that Dr. Thompson selected for him a simple random sample from the universe of investigated referrals.[7] The term "simple random sample" (SRS) is a basic statistical term with a very precise meaning. SRS means that observations were selected at random and all observations had <u>equal probability of being selected into the sample</u>. If Mr. Goad's sample of investigated referrals was selected from a sampling frame of 343 out of the 420 observations in the universe, then 77 observations had <u>zero probability</u> of being selected into the sample. Therefore, Mr. Goad's sample of 84 investigated referrals <u>cannot</u> be a simple random sample of the universe of 420 investigated referrals.

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[6] Mr. Goad's deposition transcript "67235 GOAD JOHN 042011-CT" p 64 line 1.
[7] Mr. Goad's deposition transcript "67235 GOAD JOHN 042011-CT" p 72 line 11.

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Both Mr. Goad and I would therefore assert that this was not a "valid sample": "Q. Do the inferences on the estimates of confidence intervals in your research depend on the drawing of a simple random sample of the population? A. Yes. If it was not a random sample, then the sample would not be valid. If there was some selection in picking the cases, it would measure something different than what we were trying to measure. Q. And do the inferences and estimates on confidence intervals in your research depend on the sampling unit or the observation unit having the same probability of being drawn from the population? A. That's the same thing as saying was the sample random? It's basically the same question, so the answer is yes."[8]

It is common scientific practice to use pseudorandom-number generators. Because pseudorandom-number generators do not have truly zero correlation, and because random numbers are usually the fruit of someone else's labor, it is also common scientific practice to cite the source of random numbers used in scientific work. Mr. Goad fails to cite or credit the source of his random numbers.

As a basic check that the samples ultimately used in the analysis are representative of the universe, I always check for bias (e.g. selection bias due to case files being unavailable) in the final sample using 2 and 3-way contingency tables and chi-squared, rank sum, signed rank or other statistical tests of similarity to the universe. Mr. Goad did not report any evidence that his samples were similar to his universe, beyond his assertion of SRS.

Sample Size

Mr. Goad's retainer specifies "a statistically significant sample of records". Mr. Goad's report, page v, states "The sample sizes are statistically significant ..." It is my opinion that the terms "statistically significant sample", "sample sizes are statistically significant ", and "statistically valid sample" have no specific or interpretable meaning to statistical experts. Mr. Goad is not a statistical expert, and I can infer from the use of these terms that his report was not reviewed by a statistical expert.

Mr. Goad did not reference a sample size calculation in any of his materials, despite the following exchange during deposition: "Q. Why did you not reference a sample size calculation method in your report? A. I don't know that we didn't. We talked about the size of the sample, and we -- I discussed how that -- why that was valid, why that was a sufficient sample size, so I'm not sure that I agree that we didn't do that."[9] We are left with just one clue as to Mr. Goad's understanding of sample size: "Q. Would a sample size of 50 have been large enough so that results of the review could be applied to the universe of all CPS investigations during 2009? A. Yes, but there would have been wider confidence intervals. Q. Would the same thing be true if a sample size was 25? A. That would probably not be something that could be applied to the universe. The standard with a universe that size is approximately 10 percent."[10]

In order to illustrate the need for a careful sample size calculation, I put the parameters of one of Mr. Goad's estimates into the survey sample size calculator used by Dr. Milner for his

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[8] Mr. Goad's deposition transcript "67235 GOAD JOHN 042011-CT" p 72 line 12.
[9] Mr. Goad's deposition transcript "67235 GOAD JOHN 042011-CT" p 71 line 10.
[10] Mr. Goad's deposition transcript "67235 GOAD JOHN 042011-CT" p 71 line 21.

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expert report in this case: http://www.surveysystem.com/sscalc.htm . On page 20 of his report, Mr. Goad estimates that 14 of 158 wards (8.9%) were not contacted timely. Mr. Goad represents that from his sample size of 158 wards (one of many instances in which Mr. Goad confuses his unit of observation) he has "95% certainty" that the true population proportion is within ±4.0% of his 8.9% estimate. Entering a confidence level of 95%, a confidence interval of ±4.0%, and a population of 645 wards, http://www.surveysystem.com/sscalc.htm recommends a sample size of 311, 48% of the population and nearly twice Mr. Goad's 158 wards.

Since the response times among wards in the same case are correlated, we would have to further increase the sample size beyond 311 to maintain a ±4.0% interval at a 95% level. Why so many more samples? This is primarily due to this sample size calculator's conservative, worst-case assumption that its users need to estimate a population proportion at 50%. Estimates of population proportions near 50% require larger samples than those near 0% or 100%. This illustrates why even non-statistical experts generally include basic parameters (confidence level, confidence interval, and population size) and the form of sample size calculations in scientific reports.

Confidence Intervals

Mr. Goad states on p 15, "The confidence interval represents the statistical range within which the reviewers can be 95% certain that a particular finding will fall when applied to the universe of study subjects." That is not a technically correct definition, but I doubt that a technically correct definition would help the reader. For a rich understanding of confidence intervals, I recommend http://en.wikipedia.org/wiki/Confidence_interval over the texts from which I learned frequentist statistics.[11] [12]

In what I would consider plain English … I think that the important points to understand are:

1. Statisticians generally use sample proportions calculated from a random sample as our best estimates of population proportions;
2. Statisticians generally select a sample size to get fairly precise estimates (within ±3-5%) of all proportions in a study with a 95% or better confidence level; and
3. The combination of a point estimate and a precision allows a reader to judge both the magnitude and the quality of the estimate, e.g. 8.9% ±4.0% or 8.9% (95% CI: 4.9, 12.9).

In Mr. Goad's report the precision of the estimates varies in order to accommodate the sample size. The reader is almost always given the limits of the confidence interval, normally used to judge precision or lack of precision, but the reader is frequently not given the actual estimate. Mr. Goad appears to be directing the reader's attention to the limits of the confidence intervals, indicating the lack of precision on his estimates, rather than the point estimates of the proportions.

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[11] Fisher, RA. (1956) Statistical Methods and Scientific Inference. (3rd ed., 1973) New York: Hafner Press.
[12] Hogg, RV, Craig AT. (1956) Introduction to Mathematical Statistics. (4th ed., 1978) New York: Macmillan.

Continuing the above CPS response time example, the lower limit of the 95% confidence interval, 4.9%, is greater than zero, so Mr. Goad might conclude that not all response times in the universe are within Mr. Goad's definition of "reasonable" (Mr. Goad does not define "reasonable" for the reader), if all of the assumptions underlying the use of that confidence interval were met. I check two of those assumptions here:

One assumption is "<u>independent observations</u>", meaning that the observed response times of the wards are uncorrelated. Since we have up to 6 wards per referral, and 40% of referrals in the universe involve more than 1 child, that assumption is frequently violated.[13] The correlation of those wards' response times would effectively widen the confidence interval (I leave it to Mr. Goad to calculate the amount). In Mr. Goad's considered materials, the SPSS data file "Goad 01588.sav" provides the contact dates of the 158 wards in his investigated sample. Thirty-five of the 41 investigated referrals (85%) that involved more than 1 child had the <u>same contact date for all children</u> in the referral, so an effective sample size of 84 for this particular statistic is not unreasonable. Mr. Goad was unable to tell us how he calculated his confidence intervals, but, judging from his other confidence intervals, he would probably have an estimate of 8.9% ±6% after adjusting for the correlation of these wards' contact dates. So, after adjusting for some of the correlation, Mr. Goad would probably find, in his parlance, that at least 18 (in contrast to 31 in Mr. Goad's report) of the estimated 645 wards were not contacted within a reasonable time period.

Another common assumption is that the observations came from a <u>normally distributed</u> (Gaussian, bell-curve) random variable. The underlying distribution of response times is most likely to be exponential, but Mr. Goad has applied a dichotomous condition, "reasonable", making his observations either true or false and the underlying distribution binomial. In the few places where Mr. Goad's report supplies the reader the point estimate and the confidence interval, I find that all of Mr. Goad's confidence intervals are symmetric. Binomial confidence intervals on proportions are only symmetric when the point estimate is 50%, so I find that Mr. Goad incorrectly assumed as symmetrical distribution, most likely normal. He did not use an exact or binomial confidence interval calculation.

Mr. Goad has at least 4 and possibly more data entry errors in his referral and contact dates, indicating some issues with data quality. One possible data entry error may have caused Mr. Goad to erroneously conclude that the ward was not contacted in a reasonable time. Another ward with a referral and contact <u>on the same day</u> (so under 24 hour response time) was marked as not contacted in a reasonable time, though, again, we do not

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[13] Mr. Goad's considered materials, Goad 01593.xls.

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know Mr. Goad's definition of a reasonable time.[14] Putting just these few adjustments and corrections together, the lower limit of Mr. Goad's confidence interval would be close to zero where he would be unable to reject the null hypothesis, and Mr. Goad might conclude that 100% of response times in the universe may be "reasonable."

In my opinion, all of the estimates and confidence intervals involving counts of wards in Mr. Goad's report are similarly flawed, invalid, and could not be used to draw inferences, even with a proper universe and a simple random sample of sufficient size to give better precision. Mr. Goad's estimates involving counts of the observation unit, referrals, might be salvageable, but as presented in Mr. Goad's report they were drawn from a non-representative universe (in that the universe contained 420 referrals, while Mr. Goad's universe contained 343 referrals), they may not be a simple random sample, they include children outside the universe, and the calculations are also too unreliable to be used to draw inferences.

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[14] From Mr. Goad's considered materials, Goad 01588.sav after linking to Goad 01631.sav:

id	caseID	refer.dt	contact.dt	reasonableTime
8	119	2009-01-24	2009-01-24	yes
8	119	2009-01-24	2409-01-01	yes
8	119	2009-01-24	2009-01-24	yes
8	119	2009-01-24	2009-01-24	yes
10	121	2009-02-05	2009-02-09	yes
10	121	2009-02-05	2009-02-25	no
21	135	2009-02-23	1995-02-25	yes
26	140	2009-03-31	2009-04-01	yes
26	140	2009-03-31	2009-04-01	yes
26	140	2009-03-31	2009-04-01	yes
26	140	2009-03-31	1899-12-31	yes
26	140	2009-03-31	2009-04-01	yes
26	140	2009-03-31	1899-12-31	yes
27	141	2009-03-19	2009-03-19	no
45	160	2009-05-06	2006-05-07	yes
59	174	2009-09-01	NA	yes

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National Measures

Time to Investigation

The federal government provides a rich set of national child welfare statistics at http://cwoutcomes.acf.hhs.gov/data/. Mr. Goad could have compared the response times among his sample of OK DHS investigations to the FFY2009 national statistics. Mean times in hours from report to investigation are provided for each state: [15]
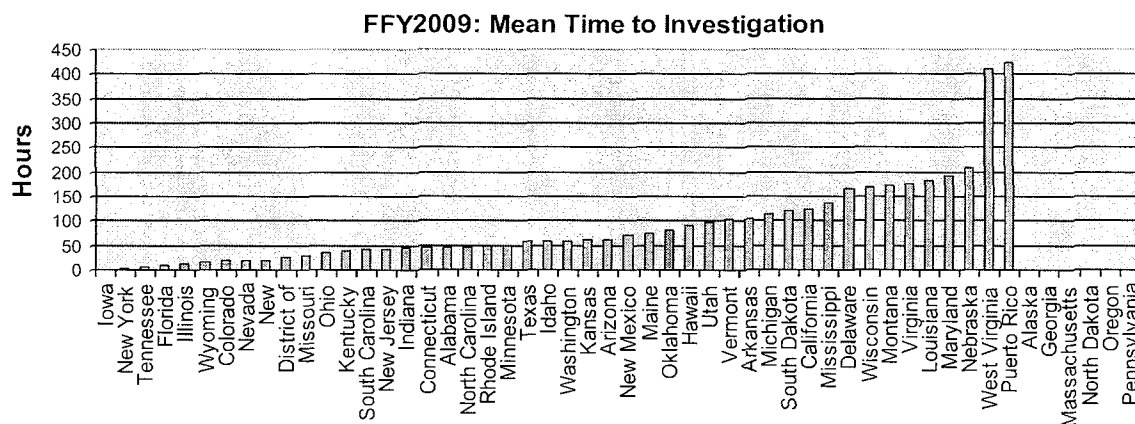

Figure 1

I include this chart to convey a visual impression of the wide range of practices among the states and territories. Mr. Goad's and his reviewers' opinions were likely shaped by their long careers in Cook County, Illinois, where they had exceptionally short response times. Though IL's median time to investigation still falls into the same broad federal category as OK's (">48 but <72"), the mean time to investigation is 13 hours, versus 80 hours in OK.[16] Having worked for 6 years with Illinois, I have learned that IL DCFS practice is very different from the rest of the country. I do not view the broad range of practices among states as a negative. Coupled to a standardized set of outcome measures, I view this as an opportunity to learn what practices objectively work best to protect children.

I include this also to illustrate that learning from the range of practices requires that we always challenge and test assumptions, such as an assumption that a process measure like short response times might lead to improved protection and lower rates of maltreatment in foster care. The state with the highest federally measured rate of maltreatment in foster care, New York at 2.04%, is also the state with the second shortest mean time to investigation, 4 hours.[17] In Georgia's Fulton and DeKalb Counties, 99% of investigations of maltreatment in foster care are commenced within 24 hours, but the maltreatment in foster care rate in those counties is 0.63%.[18]

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[15] From http://www.acf.hhs.gov/programs/cb/pubs/cwo04-07/cwo04-07.pdf : "Mean and median time to investigation (the time between the maltreatment report and the first face-to-face contact with the investigating caseworker)."

[16] http://bit.ly/ixW8sM visited 6/9/2011.

[17] http://bit.ly/kiqV3Z visited 6/9/2011.

[18] http://childwelfare.net/activities/kennya/Summary20101222_table1.html visited 6/9/2011.

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The "protection of CPS investigation"

I also challenge the assumption that CPS investigations protect children from harm. Mr. Goad cites the "protection of CPS investigation" three times in his report.[19] In 2004 the state of Georgia protected children in 135,535 CPS investigations, finding 50,867 victims of maltreatment. Within 6 months of that finding, 4,380 children (9%) had been victimized again. In other words, in 2004 Georgia failed to protect 9% of confirmed victims from re-victimization within 6 months (the CFSR standard measure).

Today Georgia investigates less than 1/3 as many families as in 2004, but victims are far better protected, with only 2% (406 children) re-victimized within 6 months.[20] The logic behind the somewhat counter-intuitive numbers is this: Improved protection comes from more judicious use of higher-quality investigations for only the victims at risk of future harm and the improved protective measures that result from improved information. Frontline case managers must always be cognizant of the cost of invasive state interventions in terms of damage to families. In situations where the threat has already been removed, investigation may not be warranted.

The Federal Child and Family Services Review

My work in the Fostering Court Improvement project focuses heavily on national measures of child welfare outcomes. Working with 15 states has provided me many examples of the wide range of statutory, policy, practice, and population differences among the states, and their influence on child welfare outcomes and outcome measures. The judges, attorneys, and court volunteers that I train prefer to focus on the cause and effect between policy and child outcomes, rather than the measures of process on which Mr. Goad focused.

Among the national measures used in the federal Child and Family Services Review (CFSR), the measure of maltreatment in foster care is the single least reliable (highest coefficient of variation).[21] After many years working with the state of Georgia specifically on improving performance on this measure, and more recently with the City of Baltimore on their federal consent decree, plus countless discussions with state child welfare commissioners and data managers, it is my opinion that the large variation in measured state rates of maltreatment in foster care is primarily the result of training and practice differences, not policy or statutory differences. It is my opinion that, as currently implemented, this CFSR measure serves to inform us more about state reporting practices than about the true underlying incidence of maltreatment in foster care.

The decrease of Oklahoma's federal CFSR maltreatment in foster care measure from 1.22% in FFY2007 to 0.57% in FFY2009 shown in Figure 2 is one of many examples of why I think training and policy are the primary drivers of the high variability of this measure.[22]

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[19] Goad report pp 68, 82, and 88.
[20] http://fosteringcourtimprovement.org/ga/.
[21] Barclay considered materials cwo_CFSR2009.xls, sheet 2.
[22] http://bit.ly/k0aZvb visited 6/9/2011 and 03/15/2011 communication from Attorney Bob Nance that OK's corrected FFY2009 CSFR measure of maltreatment in foster care is 0.57%.

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Based on the changes I have seen other states make, I find it reasonable that the 53% decrease in this measure is primarily due to a training change identified in the federal *Child Welfare Outcomes 2003-2006: Report to Congress*: "Oklahoma made changes to the SACWIS system in 12/2007 that should help workers identify when a referral should be entered as a foster home policy violation rather than investigation."[23]

Oklahoma may have lagged the other states in making this change. The national standard for this measure was originally set at (less than) 0.57% (same as OK in 2009) using the 75th percentile of state

Figure 2

performance during CY1998. The national standard was then amended in 2007 to (less than) 0.32% (the pink line in Figure 2) using the 75th percentile of state performance during FFY2004. The yellow line in Figure 2 shows the trend of the national median, dropping from 0.48% in 2004 through 2008, now leveling out. The FFY2009 national median was 0.34%, very near the FFY2004 75th percentile.
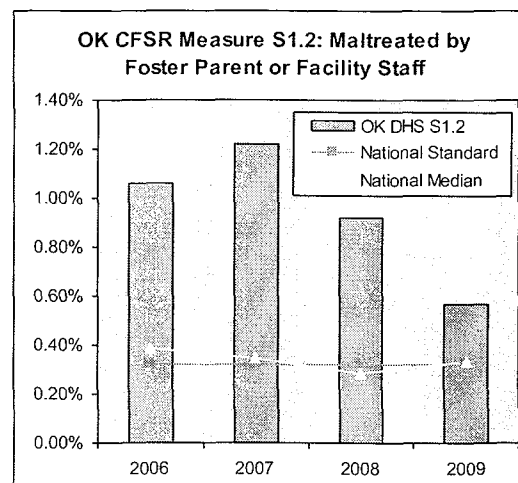
I remain very concerned as long as one or more children are maltreated while in OK DHS or any other state's foster care. We need reviews of the sort that Mr. Goad attempted, primarily because the federal CFSR measure is such a poor indicator of the true incidence of maltreatment in foster care. The lack of consistency and objectivity in state reporting can be overcome by independent reviews, but the reviewers need to have detailed knowledge of CFSR procedures; they need to interview stakeholders, use consistent standards across states, have significant experience in multiple states to appreciate the range of standards, and possess independence from interested parties. Mr. Goad and his reviewers do not appear to qualify. The cultural shift in the field of child welfare toward objectivity and standardized measures remains incomplete.

Perpetrator Relationship

Reviewers of maltreatment in foster care need to appreciate the importance of collecting and reporting diagnostic information such as the perpetrator's relationship to the child, and they need to understand the nuances of the federal definition of such quantities. Mr. Goad reported no data on perpetrator relationship. This is an odd, and critical, omission.

The federal CFSR measure of maltreatment in foster care counts only victims who have been maltreated by a foster parent or facility staff. Among the 12 states participating in the Fostering Court Improvement project the majority of substantiated maltreatment incidents during stays in foster care are perpetrated by biological parents and relatives. I prefer to count any and all victims of maltreatment in foster care without respect to perpetrator

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[23] http://www.acf.hhs.gov/programs/cb/pubs/cwo03-06/state_data/oklahoma.htm

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relationship, because that reflects the child's unsafe experience, rather than the perceived liability of the agency.

Conclusion

In my opinion, Mr. Goad was not qualified to determine the sample size, determine the measures, oversee the calculations, or interpret the results in his study. Due to methodological errors, Mr. Goad failed to show that his opinion is significantly different from OK DHS, though, based on Mr. Goad's rhetoric, I feel certain that it is.

In my opinion, all of the estimates and confidence intervals involving counts of wards in Mr. Goad's report are invalid, not representative of his universe, unreliable, and cannot be used to draw inferences. In my opinion, Mr. Goad's estimates involving counts of referrals are also invalid, not representative of his universe, unreliable, and cannot be used to draw inferences. The larger central question of safety in OK DHS custody in this case remains unanswered.

I reserve the right to use as an exhibit at trial my report, any of the charts, figures, tables or diagrams contained in my report, as well as any item in my considered materials. Publications I have authored in the last ten years are listed on my resume in Appendix A. During the previous four years I have not testified as an expert at trial or by deposition. As compensation for the work I have performed in this case, I will charge $180 per hour. As of June 8, 2011 I have not yet invoiced or been paid. I have expended 160 hours for a total of $28,800 compensation.

Andrew B. Barclay
June 9, 2011

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Appendix A

Resume of Andrew Barclay, MSEE, MSME as of June, 2011

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I am a biostatistician and an engineer. I have worked in the field of child welfare for 13 years. I maintain child welfare outcomes statistics for the 12 states that participate in the Fostering Court Improvement project (FCI). I am a funder, a co-founder, and the statistician for the project. The FCI statistics are used to train juvenile court judges, attorneys, and other stakeholders in the interpretation and tracking of their local outcomes. I train, analyze data, and write software in the child welfare field full-time. I also founded and chair the Barton Child Law and Policy Center at the Emory University School of Law. I previously worked part-time building statistical modeling software for major drug manufacturers' new drugs. Prior to that, I worked for 15 years in medical imaging research (PET, SPECT, and MRI).

Education / Training

Emory University Rollins School of Public Health, Atlanta, GA
Biostatistics, All But Dissertation, 1998-

Georgia Institute of Technology, Atlanta, GA
Electrical Engineering, Master of Science, 1992

Stanford University, Palo Alto, CA
Mechanical Engineering, Master of Science, 1985

Tulane University, New Orleans, LA
Mechanical Engineering, Bachelor of Science, 1982

Employment and Professional Experience

Child Welfare Data Consulting
Recent Projects:

- Expert Witness for Riggs, Abney, Neal, Turpen, Orbison, & Lewis P.C. representing the Oklahoma Department of Human Services in D.G. v. Henry federal class action lawsuit, Tulsa, OK. 8/2010 to present
- Data Consultant and Software Developer for the Independent Verification Agent under contract to the University of North Carolina in the L.J. v. Massinga federal class action lawsuit, Baltimore, MD. 1/2010 to present

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- Visiting Statistician in the Permanency Innovations Initiative, University of Illinois Jane Addams College of Social Work, under contract from the Illinois Department of Children and Family Services, Chicago, IL. 5/2011 to present
- Data Consultant and Software Developer for Casey Family Programs, Seattle, WA. 4/2011 to present
- Training and Data Consultation on the federal Child and Family Services Review for Children's Rights, Inc., New York, NY. 4/2011
- Reviewer, *Preliminary Protective Hearing (PPH) Benchcard Study* for the National Council of Juvenile and Family Court Judges, Reno, NV. 1/2011

Ongoing and Past Projects:

- Statistician (unpaid) to the Fostering Court Improvement project. Develop, field-test, and train juvenile court judges, attorneys, and other stakeholders in 12 states on the use of over 150 child welfare outcome statistics. 8/2005 to present
- Consultant (unpaid) to the Georgia Supreme Court Committee on Justice for Children. 1998 to present
- Consultant (unpaid) to Georgia's state Office of the Child Advocate. 11/2000 to 10/2010
- Academic Consultant and Software Developer, University of Illinois Jane Addams College of Social Work, Urbana, IL. 2/2007 to 7/2009
- Technical Lead (unpaid), Data Analysis Team, Georgia's Child and Family Services Review. 11/2000 to 8/2004

Prior Work Experience
Consulting:

- Statistical Software Consultant, building markov and monte-carlo simulators from clinical trials data to demonstrate side-effects and cost-effectiveness of new drugs to government and managed care regulators for Pfizer, Wyeth, Forrest, Amgen, Astellas, Genentech and others. Policy Analysis, Inc., Boston, MA. 3/2002 to 12/2009
- Web-based MCMC Influenza Simulator for Thomson's Physicians World. 11/2002 to 9/2003
- Software Architecture Consulting on Java and Web Technologies to GE, Siemens, Hitachi, Adac and other medical imaging manufacturers. 1996 to 1997

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Employment:

- ORISE Fellowship with the Centers for Disease Control and Prevention's National Center for Environmental Health. 2002 to 2004
  - o Development of spatial-statistical software tools for field epidemiologists
- Research Scientist with the Cardiothoracic Research Lab, Emory University School of Medicine, Atlanta, GA. 1992 to 1996
  - o PET/SPECT/MRI, Medical Imaging and Digital Signal Processing Research, High Performance Computing, Telemedicine, Software Engineer, Software Architect
- Research & Development Engineer with Digital Design, Inc., Paris, France. 1989 to 1992
  - o SPECT, Medical Imaging, Satellite Imaging, Digital Signal Processing, Software Engineer
- Research Engineer, Positron Emission Tomography, Sloan-Kettering Cancer Research Institute, New York, NY. 1986 to 1988
  - o PET Technologist, Medical Imaging, Software Engineer
- Research Assistant, Department of Mechanical Engineering, Tulane University, New Orleans, LA. 1982 to 1984
  - o Design, Project Management, Robotics, Software Engineer

Honors

- $1 Million Java Cup International Programming Competition, 1st Place, Individual, Unlimited, "Volume Slicer Applet". 1996
- Emory University Humanitarian Award. 2004
- Thirteen other public service awards for volunteer work. 1996 to present
- Advisory Board Chair, Barton Child Law and Policy Center at Emory University School of Law. 2000 to present
- Board Member, Georgia Governor's Office for Children and Families, appointed by Georgia's Governor. 2004 to present
- Board Member, Georgia Technology Authority, appointed by Georgia's Chief Justice. 2001 to 2005
- Full Tuition Scholarship and Stipend, Emory University Rollins School of Public Health Department of Biostatistics. 1997 to 2001
- Lincoln Foundation Design Competition, Bronze Medal, "Heavy Truck Air Suspension Design". 1985

Publications

Child Welfare:

- C Church, A Barclay, "Getting to Ground Truth: The Child Welfare Doppler Radar," University of Minnesota Center for Advanced Studies in Child Welfare, CW360, p 34, Spring 2011.

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Locker, Beth, and Andrew Barclay. "Measuring the next 30 years." University of Michigan Journal of Law Reform 41.1 (2007): 269-280.

Selected Child Welfare Conference Presentations:

- Andy Barclay, *Georgia's CFSR Experience*, Casey Family Programs Meeting on Optimizing Child Welfare System and CFSR Performance, 2/8/2011.
- Andrew Barclay, Isabel Blanco, Christopher Church, *The Child and Family Services Review: A Lens to Examine Georgia's Changing Child Welfare Environment*, http://www.youtube.com/watch?v=q_jjYPxdawc, Georgia Child Welfare Legal Academy, Emory University School of Law, 10/8/2010.
- Andy Barclay, *National Perspective on Georgia's Child Welfare Outcomes*, National Governor's Association Georgia Mini-Institute, 6/23/2010.
- Donald Duquette, Andrew Barclay, *Protecting Children and Protecting Liberty: Improving Decision-Making in Removing Children in CPS Cases*, 17th National Conference on Child Abuse and Neglect, 4/2/2009.
- Andy Barclay, *Ground Truth: Using Data to Explore What's Really Happening at the Local Level*, Fulton County Justice for Children Summit, 9/19/2008.
- Andy Barclay, *"Children Safe in Permanent Families" A Dependency Court Bottom Line*, 31st National Juvenile and Family Law Conference, National Association of Counsel for Children, 8/4/2008.
- Andy Barclay, *Illinois NCANDS & AFCARS Child Welfare Measures for Courts*, UIUC Children and Family Research Center Retreat, 5/10/2007.
- Judge Nancy Salyers, Andrew Barclay, *Data: Telling a Story … A Walk Through Meaningful Data Analysis*, Fostering Court Improvement, A Data Workshop for Decision Makers, 12/7/2006.
- Andy Barclay, *Engaging Court Stakeholders in Using Child Welfare Outcome Measures*, Casey Family Programs, Putting Data to Work, 10/17/2006.
- Andy Barclay, *Using AFCARS Data in Courts*, National Resource Center on Child Welfare Data and Technology Conference, 7/22/2005.
- … and over 130 presentations to local juvenile court stakeholders.

Biostatistics:

- Waller, L.A., and Barclay, A.B. (2003). "Agile" GIS: Building application-specific spatial analytic software from freely available software tools. Chance, 16, 39-44.

Medical Imaging:

- EVR Di Bella, GT Gullberg, AB Barclay, RL Eisner, "Circumferential Profiles for Region-based Analysis of Dynamic SPECT Data", IEEE Medical Img. Conf. Proceedings, 1997.

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EVR Di Bella, GT Gullberg, AB Barclay, RL Eisner, " Automated region selection for analysis of dynamic cardiac SPECT data", IEEE Trans. Nucl. Sci., vol. 44, no. 3, pp. 1355-1361, June 1997.

EVR Di Bella, AB Barclay, RL Eisner, RW Schafer, "Comparison of rotation based projectors for iterative reconstruction algorithms," IEEE Trans. Nucl. Sci., vol. 43, no. 6, pp. 3370-3376, December 1996.

EVR Di Bella, RL Eisner, AB Barclay, RE Patterson, DJ Nowak, "Attenuation artifacts in SPECT: Effect of "wrap around" lung in 180 degree cardiac studies," J. Nucl. Med., vol. 37, pp. 1891-1896, November 1996.

EVR Di Bella, GT Gullberg, AB Barclay, RL Eisner, "Automated Region Selection for Analysis of Dynamic Cardiac SPECT Data," IEEE Medical Imaging Conference, October, 1996.

EVR Di Bella, RL Eisner, LS Schmarkey, AB Barclay, RE Patterson, DJ Nowak, DS Lalush, BMW Tsui, "Heterogeneity of SPECT bull's eyes in normal dogs: Comparison of attenuation compensation algorithms," IEEE Trans. Nucl. Sci., vol. 42, no. 4, pp. 1290-1296, August 1995.

AB Barclay, RL Eisner, EVR Di Bella, "Construction of a thorax model database from clinical PET attenuation scans," SNM 42nd Annual Meeting, June 1995.

TH Chu, AB Barclay, RE Patterson, RL Eisner, "Software validation and quality assurance for a new program to evaluate SPECT myocardial perfusion images," SNM 42nd Annual Meeting, June 1995.

EVR Di Bella, RL Eisner, AB Barclay, RE Patterson, "Attenuation artifacts in SPECT: Effect of "wrap around" lung in 180 degree cardiac studies," SNM 42nd Annual Meeting, June 1995.

KB Churchwell, WC Pilcher, RL Eisner, AB Barclay, RE Patterson, "Quantitative analysis of positron emission tomography: the "women's test" for coronary artery disease," SNM 42nd Annual Meeting, June 1995.

EVR Di Bella, RL Eisner, AB Barclay, RE Patterson, "An evaluation of the iterative chang algorithm in large females," SNM 42nd Annual Meeting, June 1995.

KB Churchwell, WC Pilcher, RL Eisner, TH Chu, AB Barclay, J Streeter, S Schmarkey, C Eaves, P Morrison, RE Patterson, "Accuracy of PET rubidium myocardial perfusion imaging to diagnose coronary disease: new software for objective quantitative analysis," SNM 41st Annual Meeting, June 1994.

AB Barclay, TH Chu, RE Patterson, RL Eisner, "A nuclear medicine network for remote viewing and distributed processing," SNM 40th Annual Meeting, June 1993.